or polished flints or human bones have been found in this lower layer up to the present time.

At a short distance from the entrance the Neolithic finds cease, leaving the stalagmite uncovered; but, on the other hand, the quaternary hearths persist, and they are less dark in colour, and of reddish hue, owing to clay with which they are mixed. Further on the hearths become simple layers of clay, containing quaternary fauna and worked flints. Further on still, about seventy yards from the entrance, there is a great accumulation of remains of bears, and hyænas' teeth, &c.

Owing to the excavations made under the direction of M. Rivière, it is possible to go about a length of 136 yards in the cave with perfect ease. A further distance of eighty yards may be traversed, but only by crawling, as the passage is very small.

The drawings on the sides of the cave were first noticed in April last year; they consist generally of two kinds—some simple, made on the walls and ceiling (vault) of the cave; others with certain features coloured with ochre. There is a third kind, consisting of a scratching of the rock, the scratches being covered also with ochre. The first and second represent animals only. In some cases it is difficult to make out what is represented; two, however, have been identified, one being a bison; the other the hinder limbs of which seem to represent a kind of ox, while the head (of which part is effaced) resembles a horse with a short mane. It measures no less than two yards in length from the tip of its snout to the end of its tail.

The photographs of these two drawings, which were sent to the Academy, were taken by M. Charles Durand, They were obtained by means of an illumination of 140 candles, and an exposure of four and a half hours. M. Rivière and M. Durand hope at some future time to photograph the other engravings.

## *HENRY NEWELL MARTIN.*

HENRY NEWELL MARTIN was born on July 1, 1848, at Newry, Co. Down, Ireland. He was the eldest of a family of twelve, his father being at the time a Congregational minister, but afterwards becoming a schoolmaster. Both his parents were Irish, his father coming from South Ireland, and his mother from North Ireland. He received his early education chiefly at home; for though he went to several schools, his stay was not long at any one of them.

Having matriculated at the University of London before he was fully sixteen years of age (an exemption as to age being made in his favour), he became an apprentice to Dr. McDonagh, in the Hampstead Road, London, in the neighbourhood of University College, on the understanding that the performance of the services which might be required of him as apprentice, should not prevent his attending the teaching at the Medical School of the College, and the practice at the Hospital. It was here that I made his acquaintance in 1867. I was at that time teacher of histology and practical physiology at the School, having succeeded the late Dr. George Harley, and I well remember that Martin asked my permission to attend my course, in face of the drawback that, owing to his duties as apprentice above mentioned, he could only give to the study half the time demanded. I unwillingly gave permission; but soon found that Martin learnt in his half time more than the rest of the students in their whole time; and thus begun a friendship between us, which lasted until his death. During his career at University College he greatly distinguished himself, taking several medals and prizes. In 1870 he obtained a scholarship at Christ's College, Cambridge, Liversidge, now Professor of Chemistry in the University of Sydney, then a student at the Royal School of Mines, gaining one at the same time; he had, in the summer of that year, conducted at Cambridge a class of Histology for the late Sir G. Humphry. Though elected to the scholarship, Martin had some doubts whether he ought to take it up, and anxiously consulted me on the matter. I believe that my being able to tell him that I, too, was about to go to Cambridge, having been appointed Prælector of Physiology at Trinity College, finally removed all hesitation. Thus we two went up to Cambridge together in the October of that year. I at once asked him to assist me by acting as my demonstrator, and during the whole of his stay at Cambridge he was in every way my right hand. His energy and talents made my work much easier, and his personal qualities did much to make natural science popular in the University. At that time there was, perhaps, a tendency on the part of the undergraduate to depreciate natural and, especially, biological science, and to regard it as something not quite academical. Martin, by his bright ways won, among his fellows, sympathy for his line of study, and showed them, by entering into all their pursuits (he became, for instance, President of the Union, and Captain of the Volunteers), that the natural science student was in no respects inferior to the others.

In Cambridge, as in London, his career was distinguished. He gained the first place in the Natural Science Tripos of 1873, the second place being taken by Francis M. Balfour; at that time the position in the Tripos was determined by the aggregate of marks in all the subjects. While at Cambridge he took the B.Sc. and M.B. London, gaining in the former the scholarship in Zoology; he proceeded later to the D.Sc., being the first to take that degree in Physiology So soon as, or even before, he had taken his degree, he began to devote some time to research, though that time, owing to the necessity of his making money by teaching, was limited; his first publication was a little paper on the structure of the olfactory membrane, which appeared in the *Journal of Anatomy and Physiology*.

In the summer of 1873, I had assisted the late Prof. Huxley in the course of Elementary Biology which he initiated at the Royal College of Science, and in the following year I introduced a similar course into my teaching at Cambridge. In this Martin was my chief assistant; he also subsequently acted as assistant in the same course to Prof. Huxley. One result of this was that he prepared, under Huxley's supervision, a text-book of the course which, under their names, appeared with the title "Practical Biology," and which has since been so largely used.

In 1874 he was made Fellow of his College, and giving himself up with enthusiasm to the development of natural and, especially, of biologic science at the University, was looking forward to a scientific career in England, if not at Cambridge. About that time, however, the Johns Hopkins University at Baltimore was being established, and such was the impression made by Martin upon those with whom he came in contact, among others Dr. Gilman, of Baltimore, that in 1876 he was invited to become the first occupant of the chair of Biology which had been founded in the Johns Hopkins University. This offer he accepted, and thus nearly the whole of his scientific career was passed in America. He went out prepared to develop in his new home the higher teaching of biologic science, especially that spirit of research which alone makes teaching "high"; and during the rather less than a score of years which made up his stay at Baltimore, he produced a very marked effect on American science, fully working out the great aim of the University which had adopted him. By himself, or in concert with his pupils, he carried on many important investigations, among which may especially be mentioned those on the excised mammalian heart, one of which formed the subject of the

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"Croonian Lecture" of the Royal Society in 1883. These were, in 1895, republished in a collected form by his friends and pupils in America, under the title of "Physiological Papers." And he sent out into the States a number of trained physiologists, fired with his own enthusiasm, who are continuing to advance the science, and one of whom has succeeded him at Baltimore. He also found time to write expository works, and his "Human Body," "Briefer Course" and "Elementary Course," deservedly became very popular in the States.

Upon his first appointment he had the charge of the whole subject of animal biology, and since he was himself more distinctly a physiologist, it was almost his first duty to secure or train up a colleague who should devote himself to morphology. Martin early saw the worth of one of his students, W. K. Brooks; to him he gradually entrusted morphological matters, and thus prepared not only the way for a separate chair of Zoology, but also the man to fill it.

He was elected into the Royal Society in 1885; he also received the title of Hon. M.D. from the University of Georgia.

Martin married in 1879 Mrs. Pegram, the widow of an officer in the Confederate army; but there was no issue, and in 1892 his wife died.

Even before his wife's death his health had begun to give way; and after that event, he became so increasingly unfitted for the duties which his own previous exertions had raised to a very great importance, that in 1893 he resigned his post.

After his resignation he returned to this country, for he had never become an American citizen, and was looking forward to being able, with improved health, to labour in physiological investigations, either at his old University or elsewhere in England. But it was not to be. Though he seemed at times to be improving, he had more than one severe attack of illness, and never gained sufficient strength to set really to work. During the past summer he visibly failed; and while he was striving to recover his strength by a stay in the quiet dales of Yorkshire, a sudden hæmorrhage carried him off on October 27, at Burley-in-Wharfedale, Yorkshire.

Having been for so long a stranger to this country, Martin was, personally, but little known in English scientific circles; in America, however, not in Baltimore only, but in many other parts of the States, especially among the younger physiologists, he has left behind him a memory which will not soon pass away; while those who knew the brightness of his early days in this country, will always hold him in affectionate remembrance. And it may here, perhaps, be granted to myself to say that I can never forget what he was to me in my early days at Cambridge, and the sadness which I am feeling in the thought that he now, as well as Balfour, is no more, is mixed with pride at having been a help to two such men.

M. Foster.

## NOTES.

Admiral Sir G. H. Richards, whose death on Monday we regret to announce, earned the high esteem of men of science by his valuable hydrographical labours in various parts of the world. He was a scientific navigator, and during his life he contributed much important knowledge to marine surveying. The following particulars of his career are from an obituary notice in the *Times*:—Admiral Richards was born in 1820, and he entered the Navy in 1832. Three years later he was appointed as a midshipman in an expedition fitted out for a voyage of exploration and survey in the Pacific Ocean. He served for five years in the *Sulphur* during the surveys of the west coasts of South and North America, the Pacific Islands, New Guinea, and the Moluccas. As lieutenant on the *Philomel* he took part in a survey of the Falkland Isles in 1842, but circumstances arose which prevented the ship from completing the work. Later he was employed for four years surveying the coasts of New Zealand. Returning home in 1852, Commander Richards found an expedition fitting out for the Arctic regions, to continue the search for the missing ships under Sir John Franklin. He volunteered for and was immediately appointed to this service, sailing in command of the *Assistance* as second to Sir Edward Belcher in the Wellington Channel division of the expedition. While on this service he conducted several extended sledging expeditions, travelling more than 2000 miles over the frozen sea, and being absent from the ships on this duty for a period extending over seven months. Upon the return of the search party he was promoted to the rank of captain, and in 1856 he was appointed to the command of the *Plumper* for the survey of Vancouver Island and the coasts of British Columbia. He was employed for seven years in completing the surveys of Vancouver Island and the adjacent coasts, returning to England in 1863 by the islands of the Western Pacific, Australia, and Torres Straits, making surveys and carrying chronometric distances by the way. This voyage completed his third circumnavigation of the globe. On his arrival at home Captain Richards found himself appointed to the high post of Hydrographer of the Navy, and he discharged the duties of this responsible position for ten years, retiring in 1874. As was only natural, a man of the attainments and experience of Sir George Richards was welcomed and honoured by the principal scientific bodies. In 1866 he was elected a Fellow of the Royal Society, and in the same year a Corresponding Member of the Academy of Sciences of Paris. He was also a Fellow of the Royal Geographical Society. Nor did his energy permit him to relinquish active work on giving up the post of Hydrographer. After his retirement he occupied the position of managing director of the Telegraph Construction and Maintenance Company, and under his direction many thousands of miles of submarine telegraph cables were laid in various parts of the world. During his services at the Admiralty and subsequently he was a trusted adviser of several Administrations, and was a member of numerous Committees on confidential and general questions. He was also president of the Arctic Committee, which sat in 1875.

An appeal is being made to the men of wealth in America to provide a suitable building for the societies composing the Scientific Alliance of New York. The combined membership of these societies is now over one thousand. Nearly all of them issue valuable publications; several of them possess important libraries and growing collections of specimens, and all are actively engaged in promoting original research. Burlington House partly provides for London scientific societies, but there is no building of like character in New York, though it is hoped that one will be provided by the enlightened liberality of private citizens.

The meeting and journey to Brighton of motor-cars, arranged by the Motor-car Club as an inauguration of the appearance of those vehicles on highways under the sanction of the Act passed last Session, took place on Saturday, November 14. Fifty-four vehicles were entered for the run, but less than half of them were able to start, owing to the dense crowd of sight-seers in London and unfavourable weather. The distance to Brighton by the route followed is about fifty-five miles, over hilly country. The vehicles started at 10.30, but the crowd was so dense that they could only travel very slowly—about four miles an hour—over the first part of their course. The two Bollée cars were the first to arrive at Brighton, which they reached at 2.30 and 2.45 respectively. These did not, however, travel by way of Reigate, but went direct to Brighton, thereby saving several

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